assumed to be zero. The dispersion equation obtained for waves propagating parallel to the axis of a conducting cylinder enclosing a plasma and an axial electron beam and located in an axial magnetic field is rather involved. It is simplified for the special case of waves with phase velocity much less than the velocity of light. This dispersion equation yields several previously obtained results as special cases: in the absence of the electron beam it reduces to the dispersion relation for a plasma waveguide (A.W.Trivelpiece and R.W.Gould,J.Appl.Phys.,30,1784,1959); in the absence of the plasma it becomes the dispersion equation for an electron beam in a metal tube in the presence of a magnetic field (A.H.W.Beck, Space Charge Waves and Slow Electromagnetic Waves, Pergamon Press,1958); and as the radius of the cylinder increases without limit it approaches the dispersion equation for a cold unbounded plasma in a uniform magnetic field traversed by a uniform beam of electrons parallel to the field (D.Bohm and E.Gross, Phys.Rev.75,1851,1949; 75,1864,1949; 79,992, 1950; A.I.Akhiyezer and Ya.B.Faynberg,ZhETF 21,1262,1951). A future paper is promised in which the consequences of the dispersion equation will be discussed. Orig. art.has: 38 formulas.

L 04045-67 EWT(1)/FCC GW

ACC NR: AR6022457 SOURCE CODE: UR/0169/66/000/003/A013/A014

AUTHOR: Levitskiy, S. M.; Karplyuk, K. S.

TITLE: Investigation of radiowave interaction with the model of a meteor trail

SOURCE: Ref. zh. Geofiz, Abs. 3A57

REF SOURCE: Geofiz. i astron. Inform. byul., no. 8, 1965, 29-34

TOPIC TAGS: radiowave interaction, model theory, meteor trail, gas discharge, electron polarization, electron concentration, discharge tube

ABSTRACT: The interaction of radiowaves with a model of a meteor trail with perpendicular and parallel polarization has been studied. A long gas-discharge tube was used for a model and the measurements were carried out at a frequency of 3000 Mc. In the case of waves with parallel polarization, the obtained values of the effective reflecting diameter agreed with the Gerlofson theory. In the case of perpendicular polarization, a resonance reflection was observed. However, contrary to the prediction of Gerlofson's theory, the main resonance peak was accompanied by a series of peaks of lower intensity with lower values of electron

Card 1/2 UDC: 523.53

L 04045-67
ACC NR: AR6022457

concentration.[12] Experimental disagreements with the theory are attributed to the approximate nature of the theoretical calculations. [Translation of abstract]

SUB CODE: 03/

kh

Card 2/2

L 45926-66 EWT(1) IJP(c) AT
ACC NR: AP6028614 SOURCE CODE: UR/0057/66/036/008/1402/1408

AUTHOR: Karplyuk,K.S.; Levitskiy,S.M.,

ORG: Kiev State University im. T.G.Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Interaction of a bounded electron beam with a plasma in the presence of a magnetic field

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no.8, 1966, 1402-1408

TOPIC TAGS: plasma waveguide, plasma beam interaction, electron beam, plasma oscillation, plasma magnetic field, mathematic physics, dispersion equation

ABSTRACT: The authors discuss in the hydrodynamic approximation with neglect of the thermal motions the oscillations of a plasma filament in a longitudinal magnetic field through which there passes an electron beam. The boundary conditions at the plasma - dielectric boundary are derived and the calculations are carried through to the point where the dispersion equation can be written for any particular cylindrical system. The dispersion equation for slow waves is derived for the case of a metallic tube uniformly filled with the plasma and the electron beam, and analytic expressions are obtained for all six of its roots for the limiting case of a low intensity electron beam. Solutions of the dispersion equation for the case of a more intense electron beam were obtained with the aid of a computer, and these, as well as the analytic solutions, are discussed. Regions are found in which wave amplification occurs. These regions are delineated and the dependence of the gain on the type of oscillation is

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UDC: 533.9

L 45926-66
ACC NR: AP6028614

discussed. In the case of certain nonaxisymmetric oscillations the equations indicate that the gain is greater for the higher order oscillations than for the lower order ones; this unusual behavior may actually not occur, however, because of the increase with frequency of the plasma waveguide attenuation, which was not taken into account in the calculations. Orig. art. has: 22 formulas and 1 figure.

SUB CODE: 20 SUBM DATE: 10Jun64 ORIG. REF: 008 OTH REF: 007

Card 2/2

KARPLYUK, P., podpolkovnik

Woods and swamps are no hindrances to signalmen. Voen. vest. 43 no.9:33-34 S '63. (MIRA 16:10)

(Communications, Military)

KARPLYUK, V.

Collective farms of Zhitomir Province build simple and inexpensive corn drying barns. Sil'. bud. 11 no.8:6-7 Ag '61. (MIRA 14:9)

1. Glavnyy inzh. upravleniya stroitel'stva Zhitomirskogo oblastnogo ob"yedineniya "Sel'gosptekhnika".
(Zhitomir Province--Corn (Maize))--Drying)

KARPLYUK, V.P.; KORCHAN, A.A.

Always on the road. Transp. stroi. 14 no.1:35-36 Ja '64.
(MIRA 17:8)

MEL'MAN, Ye.P.; KARPLYUK, Z.V.; KLIPICH, V.I., KOTURBASH, S.V.; ZHAMANAYEV, [illegible]

Effectiveness of revascularization of the testis by the directed change of their blood supply; experimental study. Urologiia, 29 no.3:16-21 My-Je '64. (MIRA 18:10)

1. Kafedra anatomii (zav.- prof. Ye.P. Mel'man), Kospital'naya khirurgicheskaya klinika (zav.- prof. S.A. Verkhratskyy), kafedra biokhimii (zav.- doktor med. nauk G.A. Babenko) i kafedra topograficheskoy anatomii s operativnoy khirurgiyey (zav.- prof. L.A. Nikol'skaya) Ivano-Frankovskogo meditsinskogo instituta.

SHAMRAY, Ye.F.; KARPLYUK, Z.V.; GUDE, Z.Zh.

Quantitative change of nucleoprotein phosphorus in guinea pig skin after burns. Ukrain. Biokhim. Zhur. 25, No.1, 11-16 '53. (MLRA 6:5)
(CA 47 no.22:12597 '53)

1. Stanislav Med. Inst.

BABENKO, G.A. [Babenko, H.O.]; KAMPLYUK, Z.V.

Effect of the removal of the pancreas on the manganese content of dog tissues and organs. Ukr. biokhim. zhur. 35 no.5:732-736 '63. (MIRA 17:5)

1. Department of Biochemistry of Ivano-Frankovsk Medical Institute.

KARPlyuK, Z. V.

Vitamin P activity of some diphenols. R. F. Shamrai and Z. V. Karplyuk (Med. Inst., Stanislav). *Ukrain. Biokhim. Zhur.* 28, 231–3(1956).—A study was made of the effect of pyrocatechol, pyrogallol, phloroglucinol, resorcinol, and hydroquinone on the capillaries of mice. Animals were kept on a vitamin P-free diet consisting of oats, milk, and water ad libitum for 2 weeks, when they were injected subcutaneously with 1 mg. of the substances studied, dissolved in 0.3 ml. H_2O, on 3 successive days. Control animals were injected with equiv. amt. of saline only. Three hrs. after the last injection animals were placed in a vacuum chamber. The control animals and those which were injected with phloroglucinol, resorcinol, and hydroquinone perished at air pressure reduced to 240 mm.; those injected with pyrocatechol and pyrogallol survived until the air pressure was reduced to 160 mm. The lungs of the animals were then exaind. for capillary hemorrhages. The results indicated that polyphenols in which the hydroxyl groups are in the ortho positions (pyrocatechol, pyrogallol) possess vitamin P activity.

B. S. Levine

2/ Referativnyy Zhurnal Biokhimii

KARPLYUK, Z.V.; KHANANAYEV, L.I. [Khananaiev, L.I.]

Trace element (zinc, copper) and sugar content of blood in dogs following ligation of the three main arteries of the pancreas. Ukr.biokhim.zhur. 32 no.2:283-290 '60. (MIRA 13:11)

1. Department of Biochemistry of the Stanislav Medical Institute.
(PANCREAS--BLOOD SUPPLY)
(BLOOD SUGAR)
(TRACES ELEMENTS)

KARPMAN, B. D.

"Problem of the Construction of the Curve of Discharges"
Meteorol. i Gidrologiya, No 5, 1954, 38-39

The author considers the problem of constructing the curve of discharge for regions with well developed river valley and ancient river traces (starorech'ye). He established that in the construction of the curve of areas w =f (H) it is necessary to treat the river valley with ancient river traces as a series of river beds, which corresponds to a series of curves of areas. Discernment in a dispersed field of points of the probable curves of areas is carried out by determination of the direction of the curve at each plotted point by construction in x increments ΔH and Δw of vectors tangent to the curves. The group of points whose vectors mark out the regular curve of areas are combined into one curve. (RZhGeol, No 9, 1955)

SO: Sum-No 845, 7 Mar 56

83280

18.6200 also 2108, 2308

S/136/60/000/009/002/004
E193/E483

AUTHORS: Borok, B.A., Gavrilova, V.K., Karpman, G.M. Trifonov, Ye.A. and Zavod, Ye.B.

TITLE: Manufacture of Titanium Tubes from Sintered Material by Extrusion and Rolling

PERIODICAL: Tsvetnyye metally, 1960, No.9, pp.66-68

TEXT: Shells (85 and 100 mm in diameter, 150 to 200 mm high), prepared by powder metallurgy technique from technical grade titanium IMPl, were extruded on a 600 t vertical extrusion press, equipped with die and mandrel made of steel 3KhV8. The shells were pre-heated to 860 to 1050°C by induction heating (5 to 10 min), the temperature of the container being 200 to 250°C. A mixture of graphite and machine oil was used as a lubricant. The extrusion pressure did not exceed 180 atm when the extrusion temperature was 800°C and decreased to below 150 atm for shells pre-heated to 950°C. The extrusion speed of 8 m/sec was used, the tubes obtained being 32 to 50 mm in diameter with the wall thickness varying between 2.5 and 7.5 mm. Irrespective of the extrusion temperature employed, the extruded tubes had longitudinal scratches on both outside and inside surfaces.

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S/136/60/000/009/002/004
E193/E483

Manufacture of Titanium Tubes from Sintered Material by Extrusion and Rolling

The surface finish of tubes extruded at temperatures above 950°C was extremely bad. The condition of the container and particularly of the mandrel, after one operation only, was also very bad, owing to titanium adhering to their surfaces, which was also the cause of the longitudinal scratches on the extruded tubes. Somewhat better results were obtained when steel R18 was used as the material of the container lining and mandrel, but even then these parts had to be scrapped after each operation. Several attempts were made to improve the surface finish of the tubes by applying different lubricants; the best results were obtained with a mixture containing 4 parts of sodium chloride and 1 part of fluorspar which, however, failed to prevent the formation of the longitudinal scratches. The extruded tubes (measuring 32 x 3, 39 x 2.5, 41 x 3 and 50 x 7.5 mm) had the following properties; U.T.S. = 70 kg/mm^2; elongation, δ, = 21%; reduction of area, ψ, = 29%; Rockwell hardness, R_C = 26. The material of the extruded tubes was markedly anisotropic in respect of its mechanical properties; micro-specimens, cut from the tubes and

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Manufacture of Titanium Tubes from Sintered Material by Extrusion and Rolling

tested in the direction parallel to the tube axis, had U.T.S. = 104.6 kg/mm^2, δ = 26.2%, and ψ = 38.7%; the corresponding figures for specimens tested in the transverse direction were 120.8 kg/mm^2, 2.5% and 6.3%. Owing to the lack of suitable equipment, the surfaces of the extruded tubes were not improved before rolling. The slight curvature of the tubes was removed by hammering with wooden mallets at 800°C. Both ends of each tube with bad extrusion defects were cut off and the outside and inside surfaces were lubricated with a mixture of 60% emulsol and 40% graphite, no lubricant having been fed to the mandrel. The rolling operation was carried out on a tube rolling mill of the Rockwright type. To avoid cracking during rolling, the ends of each tube were machined to produce a taper at least 60 to 80 mm long. After the first rolling operation, during which the temperature of the tubes rose to 100°C, the tubes were annealed at 700°C by resistance heating, the heating time varying between 20 and 40 sec. The ends of the tubes were then cut off again and tapered, after which the second rolling

Card 3/4

186200 only 2308, 2808, 1417

84676

S/136/60/000/011/010/013
E021/E406

AUTHORS: Borok, B.A., Candidate of Technical Sciences, Gavrilova, V.K., Karpman, G.M. and Khromov, V.G.

TITLE: Production of Titanium Strip by Rolling Powders

PERIODICAL: Tsvetnyye metally, 1960, No.11, pp.69-76

TEXT: The present paper gives results of a systematic study of the process of titanium strip production, carried out in 1957 to 1959. The powder used had a specific weight of 0.65 - 0.80 g/cm^3 and not less than 90% of the particles were 10 μ. Impurities did not exceed: 0.25% O_2, 0.01% H_2, 0.08% N_2, 0.50% Fe + Ni, 0.08% Si, 0.05% C. A diagram of the method of production is shown in Fig.1. The thickness of the strip produced was found to be directly proportional to the specific weight of the powder and did not depend on the particle size. The maximum thickness produced was 1.20 mm on rolls of 120 mm diameter. With increase in roll diameter, the thickness of the strip could be increased. Fig.3 shows the effect of the speed of rolling on the thickness of the strip (Curve 1), the power per width of the strip in kW/cm (Curve 2), the energy consumption (Curve 3) and the productivity (Curve 4). For a rolling speed of about 3 m/min with rolls 120 mm

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84676

S/136/60/000/011/010/013
E021/E406

Production of Titanium Strip by Rolling Powders

in diameter and strip 120 mm wide, the production is 44 kg/hour or approximately 250 tons/year. With 500 mm wide strip it is approximately 1000 tons/year. The porosity can be varied from 23 to 57% by varying the distance between the rollers. The strip produced has sufficient strength for transferring to the sintering furnace. With increase in sintering temperature from 850 to 1150°C, the strength and plasticity of the strip increase (Table 2). After 30 minutes at 1400°C, grain growth was noted. At 950°C, increasing the time of sintering causes the number of pores to decrease and the grain boundaries to become more distinct. After two hours, grain growth occurs. Cold rolling the strip produced with 20 to 80% degree of reduction presents no difficulty. With increase in reduction, the mechanical properties increase. The properties of strip sintered at 850 to 1150°C, cold rolled and heat treated for 30 minutes at 700°C, are low. By repeating the cycle of the low temperature sinter and cold rolling, better properties similar to those of the control strip could be obtained (Table 4). Some trouble was encountered with the brittleness of the strip. This was associated with hydrogen impurity and could be removed

Card 2/3

L-57723-65 EPF(c)/EPR/ENG(j)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/
EWP(t) Pr-4/Pg-4/Pad IJP(c) JD/HW

ACCESSION NR: AR5015163 UR/0137/65/000/005/G034/G034

SOURCE: Ref. zh. Metallurgiya, Abs. 5G202

AUTHOR: Borok, B. A.; Karpman, G. M.

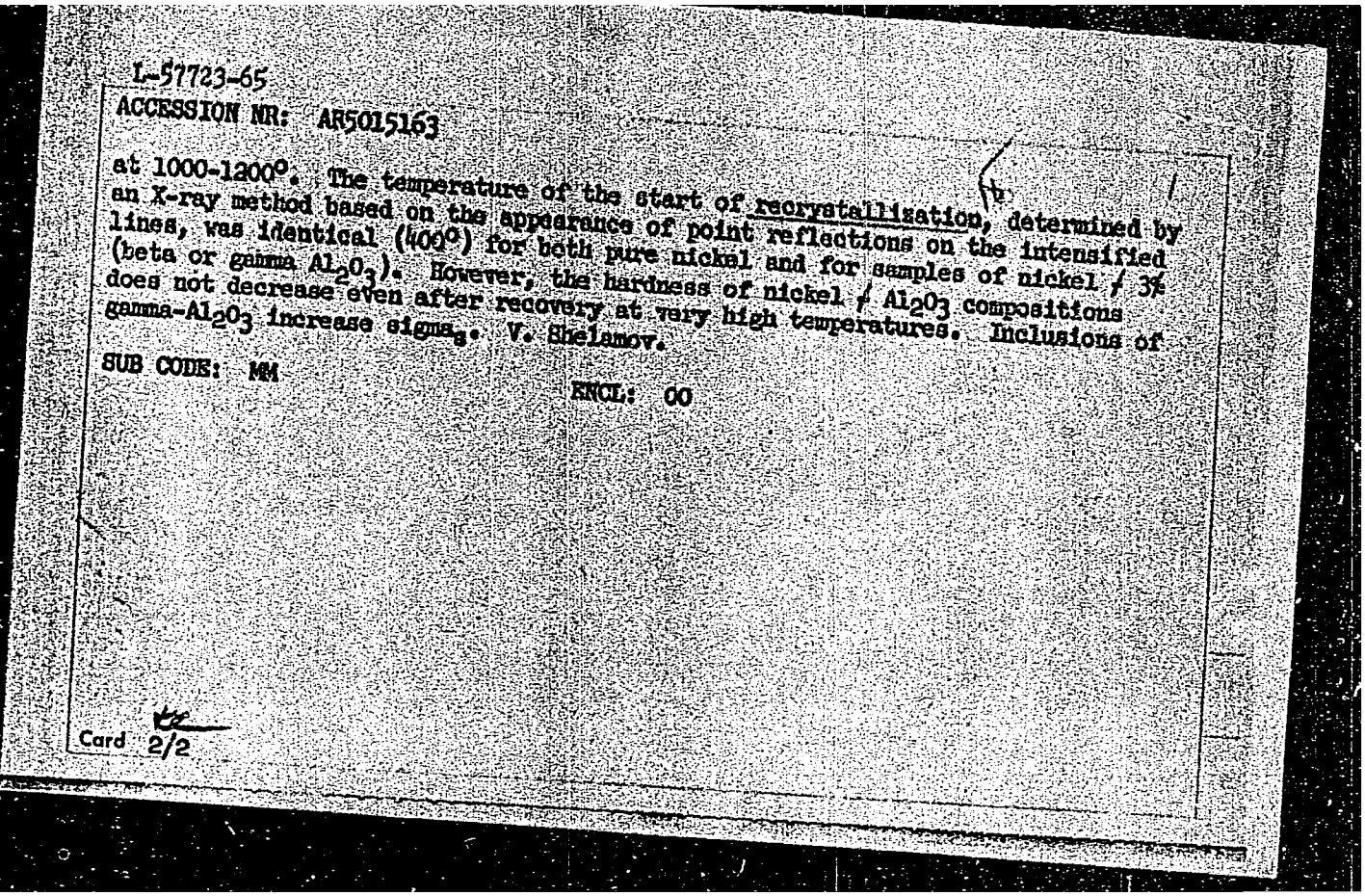
TITLE: Investigation of the effect of dispersed inclusions of aluminum oxide on the properties of nickel

CITED SOURCE: Tr. 7 Vses. nauchno-tekhn. konferentsii po poroshk. metallurgii. Yerevan, 1964, 190-194

TOPIC TAGS: nickel, aluminum oxide, inclusion, particle size, metal mechanical property, metal hardness

TRANSLATION: The article presents the results of an investigation of the effect of dispersed inclusions of Al_2O_3 (beta and gamma modifications) with a particle size, respectively, of 0.1 and 0.014 microns on the properties of nickel. The materials were mixed in a ball mill for 24 hrs, pressed hydrostatically, sintered at 1050°, and worked by extrusion (degree of reduction 90%, extrusion speed 30-35 mm/sec). The worked samples were annealed at 100-1200° for 1 hr. The hardness of samples with nickel + 3% beta-Al_2O_3 decreased after annealing at 500-600°, while for samples with nickel + gamma-Al_2O_3 it decreased after annealing

Card 1/2



L-57723-65

ACCESSION NR: AR5015163

at 1000-1200°. The temperature of the start of recrystallization, determined by an X-ray method based on the appearance of point reflections on the intensified lines, was identical (400°) for both pure nickel and for samples of nickel + 3% (beta or gamma Al_2O_3). However, the hardness of nickel + Al_2O_3 compositions does not decrease even after recovery at very high temperatures. Inclusions of gamma-Al_2O_3 increase sigma$_s$. V. Shelamov.

SUB CODE: MM

ENCL: 00

Card 2/2

L 3987-66 EWP (e)/EWT(m)/EPF(c)/EPF(n)-2/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c)
ACC NR: AT5022895 IJP(c) MJW(CL)/JD/WW/HW/JG UR/2776/65/000/043/0119/0130

AUTHOR: Borok, B. A.; Karpman, G. M.

TITLE: Investigation of the effect of oxide dispersion inclusions on properties of nickel

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 119-130

TOPIC TAGS: nickel, nickel alloy, dispersion strengthened refractory oxide, oxide containing alloy, alloy property, aluminum oxide containing alloy, titanium oxide containing alloy, chromium oxide containing alloy, zirconium oxide containing alloy

ABSTRACT: The effect of finely dispersed refractory oxides on the properties of nickel has been investigated. Nickel powder with 1—7% additions of Al_2O_3, TiO_2, Cr_2O_3, or ZrO_2 oxides was cold compacted under 200—1000 Mn/m^2 pressure and then sintered at 700—1400C. The oxides, especially Cr_2O_3, decreased the density of green compacts, but the alloy with Cr_2O_3, compacted under at least 400 Mn/m^2 pressure, attained a density after sintering at 1050C of ~87%, which was much higher than that of other alloys tested. The density of alloys with Al_2O_3, TiO_3, and ZnO_2 sintered at 1050C largely depends upon the compacting pressure. Only with sintering at 1400C was a density of over 90% attained in all investigated alloys regardless of the compacting pressure. At this temperature, the oxide particles coagulate into large inclusions. 1100C is considered the optimum sintering temperature. With increasing oxide content, the alloy

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L 3987-66

ACC NR: AT5022895

hardness, yield strength, and, to some extent, the tensile strength increase, but the ductility decreases. The dispersed oxides have no effect on the nickel recrystallization temperature, but they increase the softening temperature by 500—600C. Alloying with Al_2O_3 greatly improved the heat resistance. Alloy with 5% Al_2O_3 under 29.4 Mn/m^2 pressure at 800C has a rupture life of 625 hr, compared to 9 hr for unalloyed nickel. The other oxides have no significant effect on the alloy rupture strength at high temperatures. Orig. art. has: 11 figures and 2 tables. [ND]

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moscow (Central Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM
NO REF SOV: 001 OTHER: 011 ATD PRESS: 4120

Card 2/2

L 4404-66 EWP(e)/EWT(m)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/HW/MJW(CL)

ACC NR: AT5022896 SOURCE CODE: UR/2776/65/000/043/0131/0134

AUTHOR: Karpman, G. M.; Manegin, Yu. V.

ORG: Central Scientific-Research Institute of Ferrous Metallurgy (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moscow)

TITLE: Extrusion of dispersion-strengthened nickel bars

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 131-134

TOPIC TAGS: powder metallurgy, nickel, nickel alloy, dispersion strengthened alloy, aluminum oxide containing alloy, chromium oxide containing alloy, titanium oxide containing alloy, zirconium oxide containing alloy, sintered alloy, alloy bar, alloy extrusion

ABSTRACT: The extrusion of bars from nickel strengthened with up to 7% dispersed aluminum, titanium, zirconium, or chromium oxides has been investigated. Nickel and oxide powder mixtures were cold compacted and then sintered at 1050C for 5 hr in a hydrogen atmosphere. The sintered compacts of pure nickel had the maximum density, 90%, and those of nickel with 7% Al_2O_3 the lowest density, 55%. The compacts were machined into billets 61 mm in diameter and 150 mm long, heated in hydrogen to 1020 to 1080C, and extruded into bars 20 mm in diameter (90% reduction) with a glass lubricant. The extruded bars had a smooth surface, even in case of the 7% Al_2O_3 bars, which were the most difficult to extrude. The extrusion force required increased

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L 4404-66

ACC NR: AT5022896

with increasing oxide content. For instance, pure Ni required a specific pressure of 42.4 kg/mm^2 compared to 105 kg/mm^2 for Ni with 7% Al_2O_3. Alloys with 5—7% titanium, chromium, or zirconium oxides required a specific pressure of 65—75 kg/mm^2. Extrusion increases the density of alloys. Alloy bars containing 1—3% oxides had a density close to the theoretical. At a higher oxide content, the porosity increased to 5%. Orig. art. has: 3 figures and 2 tables. [WW]

SUB CODE: MM/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000/ ATD PRESS: 4125

Card 2/2

L 20629-66 EWP(k)/EWT(m)/T/EWP(e)/EWP(w)/EWP(t) IJP(c) JH/JD/HW

ACC NR: AP6010091 SOURCE CODE: UR/0129/66/000/003/0029/0032

AUTHOR: Borok, V. A.; Zaytseva, R. D.; Karpman, G. M.; Perkas, M. D.

ORG: TsNIIChERMET

TITLE: Strengthening and weakening of nickel alloys containing aluminum oxide

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1966, 29-32

TOPIC TAGS: nickel, nickel alloy, aluminum oxide containing alloy, alloy strengthening, alloy weakening, alloy hardness

ABSTRACT: Carbonyl nickel powder mixed with α-aluminum oxide or γ-aluminum oxide powder was compacted, sintered in a hydrogen atmosphere, and then extruded at 1050C. The obtained alloys of nickel with 0.5—7% γ-Al_2O_3 and nickel with 3.0% α-Al_2O_3 were tested for hardness and mechanical strength. Results of the tests showed that as the γ-Al_2O_3 content increased to 3 and 7%, the yield strength of extruded nickel increased to 29.4 and 40 kg/mm^2, respectively, compared to the yield strength of 18 kg/mm^2 for extruded nickel without γ-Al_2O_3 powder. The corresponding figures for the hardness were HRB 76, 87, and 45, respectively. Alpha-Al_2O_3, whether added as powder or formed from γ-Al_2O_3 with high-temperature annealing (above 1100C) of the nickel-γ-Al_2O_3 alloy, had only slight effect on the yield strength and hardness of the alloy. In nickel and its alloys with α-Al_2O_3, the hardness decreased after annealing at 400—600C, but in alloys with γ-Al_2O_3, the hardness sharply decreased

Card 1/2 UDC: 669.24

L 20629-66

ACC NR: AP6010091

only after annealing at 1100C. This showed that dispersed inclusions of γ-Al_2O_3 significantly increased the temperature of the beginning of weakening of nickel. Nickel-γ-Al_2O_3 alloy cold-strained with a reduction of 80% has a much higher hardness than extruded alloys. However, the hardness of cold-strained alloys decreased sharply after annealing at 400—450C, and in extruded alloys, after annealing at above 1000C. This seems to confirm the assumption that a high cold reduction disrupts the bonds between the alloy base and γ-Al_2O_3 particles, as a result of which the weakening of the alloys with γ-Al_2O_3 proceeds as in alloys with α-Al_2O_3. With a lower cold reduction (20—30%), weakening of alloys with γ-Al_2O_3 begins at the same temperatures as in extruded alloys. The significant advantages of nickel alloys containing γ-Al_2O_3 inclusions become most pronounced in prolonged tests at high temperatures. The best results were obtained on an alloy containing 5% γ-Al_2O_3 which, under a stress of 3 kg/mm^2 at 800C, had a rupture life of 625 hr, i.e., 70 times longer than that of pure nickel. Orig. art. has: 4 figures. [MS]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 001/ OTH REF: 004/ ATD PRESS: 4224

Card 2/2

L 27473-66 EWT(m)/EWP(t) IJP(c) JD/HW/WB

ACC NR: AP6015286 (N) SOURCE CODE: UR/0365/66/002/003/0312/0317

AUTHOR: Kravchenko, T. G.; Shelement'yeva, Ye. A.; Zhuk, N. P.; Karpman, G. M.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Oxidation resistance of dispersion-strengthened nickel

SOURCE: Zashchita metallov, v. 2, no. 3, 1966, 312-317

TOPIC TAGS: nickel, nickel alloy, dispersion strengthened alloy, alloy oxidation, aluminum oxide containing alloy, chromium oxide containing alloy, titanium oxide containing alloy, zirconium oxide containing alloy

ABSTRACT: The oxidation behavior of dispersion-strengthened sintered nickel alloys containing up to 7% Al_2O_3, Cr_2O_3, TiO_2, or 5% ZrO_2 oxides has been investigated at 800—1200C in air with a test duration of 2 hr. It was found that oxidation of all the alloys tested follows a parabolic rate with the formation of NiO scale consisting of a porous inner layer and a dense outer layer of almost the same thickness. Both layers have a cubic lattice. The outer layer has equiaxial crystals and the inner has acicular crystals. The outer scale layer on alloys with Al_2O_3 and Cr_2O_3 peels off during cooling from 1000—1200C. The scale on alloys with ZrO_2 and TiO_2 is less susceptible to cracking. All the oxides tested increase the oxidation rate at all tested temperatures. However, TiO_2 and ZrO_2 accelerate the oxidation much less than do Al_2O_3 and Cr_2O_3. Orig. art. has: 4 figures and 4 tables. [ND]

SUB CODE: 11/ SUBM DATE: 27Sep65/ ORIG REF: 008/ OTH REF: 007/ ATD PRESS: 4/260

Card 1/1 BKG UDC: 620.193.5

KARPMAN, K.I.

Psychological disturbances in hepatolenticular degeneration. Zdrav.Belor. 5 no.7:31-34 Jl '59. (MIRA 12:9)

1. Iz Respublikanskoy psikhonevrologicheskoy bol'nitsy v g. Mogileve i Mogilevskogo gospitalya dlya invalidov Otechestvennoy voyny (glavnyy vrach V.M.Volovik).
(MENTAL ILLNESS) (HEPATOLENTICULAR DEGENERATION)

KARPMAN, K.I.

Aminazine therapy in involutional depression. Zdrav. Bel. 7 no.6: 39-41 Je '61. (MIRA 15:2)

1. Iz respublikanskoy psikhonevrologicheskoy bol'nitsy v g.Mogilove (glavnyy vrach S.I.Volynets).
(DEPRESSIONS, MENTAL)
(CHLORPROMAZINE)

KARPMAN, M.A.; FEDOTOV, S.Ya.

Reducing permeability and increasing air moisture absorption in Russian leather. Leg. prom. 15 no.11:21-23 N '55.
(MLRA 9:2)

1.Glavnyy inzhener Omskogo kozhevennogo zavoda (for Karpman)
(Tanning)

Karpman, M.A.

USSR/Chemical Technology - Chemical Products and Their Application - Leather. Fur. Gelatin. Tanning Agents. Technical Proteins. I-29

Abs Jour : Referat Zhur - Khimiya, No 9, 1957, 33109

Author : Karpman, M.A., Fedotov, S.Ya.

Inst :

Title : Salt Treatment of Dehaired Hides is Effective.

Orig Pub : Legkaya prom-st', 1956, No 5, 38-39

Abstract : A verification was carried out of the salt method of dehaired hide treatment and of the effect of this method on surface area yield and raw hide expenditures. Salt treatment was conducted at a temperature of 22-23°, with a liquid coefficient of 0.9 and a concentration of salts of 117-135 g/liter (7 parts NaCl and 3 parts $(NH_4)_2SO_4$) with subsequent chrome treatment using the spent salt solution at negative basicity of 18-20%. Vegetable tanning and finishing were carried out according to a

Card 1/2

USSR/Chemical Technology - Chemical Products and Their Application - Leather. Fur. Gelatin. Tanning Agents. Technical Proteins. I-29

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 33109

single procedure. It was found that the salt treatment reduces the duration of the production cycle and simplifies technological control. Organoleptically the finished product is of entirely satisfactory quality, while the chemical and physico-mechanical indices meet the GOST. Surface area of leather is increased by 0.63%, and raw hide expenditure is reduced by 1.16% in comparison with the pickling treatment of dehaired hides. A critique is given of the objections to the salt treatment method, which were set forth in the paper by Sergeyev S.I. (RZhKhim, 1955, 28009), and it is pointed out that the salt treatment can be incorporated in the single procedure.

Card 2/2

GETTA, G.I.; KARPMAN, M.A.

Strengthen the control of cattle hypoderma. Kozh.obuv. prom. 5 no.11:12-13 N '63. (MIRA 17:1)

GIRLO, Nikolay Sozontovich; KOPOVOY, Aleksandr Nikolayevich; KARPMAN, M.A. redaktor; ANDREYEV, S.P., tekhnicheskiy redaktor.

[Processing clag dumps] Razrabotka shlakovykh otvalov. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1955. 63 p. (MLRA 8:8)
(Slag)

KARPMAN, M.A.

137-58-4-6593

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 39 (USSR)

AUTHOR: Karpman, M.A.

TITLE: Increasing the Wear Resistance of Parts is a Major Factor in Reducing Equipment Down Time (Povysheniye iznosoustoychivosti detaley — vazhneyshiy faktor snizheniya prostoyev oborudovaniya)

PERIODICAL: Tr. nauchno-tekhn. o-va chernoy metallurgii, Ukr. resp. pravl. 1956, Vol 3, pp 7-15

ABSTRACT: An analysis of down time at progressive plants due to repair of basic units of iron and steel manufacture is provided. Primary attention is given to advanced experience of various establishments in improving the resistance to wear of parts and assemblies of equipment. An efficient method of preventing wear in the transfer of raw materials is armoring the route with plates of G1ZL manganese steel, while the abrasive action of various materials may be met by hard facing with hard alloys such as stalinite and sormite with T540 and T590 electrodes. Diabase casting must be brought into wide use at crushing and classifying mills, sintering plants, blast furnaces, and

Card 1/2

Increasing the Wear Resistance (cont.)

refractory-manufacturing establishments. Armoring and lining of gas lines, dust catchers, cyclones, exhauster rotors etc., with wear-resistant refractories will markedly increase their service life. It is necessary to set up carburizing, immersion heat treatment, high-frequency surface tempering, and knurling shops at iron and steel mills. One of the most important problems is the assessment of the durability of parts to determine the effectiveness of hardening measures.

D.P.

1. Metallurgy 2. Equipment--Design 3. Equipment--Maintenance

KARPMAN, M.A., referent.

Increasing the lifting capacity of teeming cranes. Biul. TSNIICHM no.21:57-60 '57. (MIRA 11:5)
(Cranes, derricks, etc.) (Smelting)

KARPMAN, M.A., inzh.

Freight cars used at West-European metallurgical plants. Biul. TSNIICHM no.3:54-60 '58. (MIRA 11:5)
(Railroads, Industrial--Freight cars)

RYABIN'KIY, Bronislav Yakovlevich; BERLYAND, S.S., inzh., retsenzent; GERASIMENKO, V.F., inzh., retsenzent; GRUDSKIY, Ye.B., inzh., retsenzent; DASHEVSKIY, Ya.I., inzh., retsenzent; DVORIN, S.S., inzh., retsenzent; KAMALOV, O.M., inzh., retsenzent; KARPMAN, M.A., inzh., retsenzent; KASHCHENKO, D.S., inzh., retsenzent; KOROLEV, M.N., inzh., retsenzent; KORSAKOV, A.A., inzh., retsenzent; LISENKO, T.P., inzh., retsenzent; PEKELIS, I.B., inzh., retsenzent; REVYAKIN, A.A., inzh., retsenzent; ROMANOVICH, N.D., inzh., retsenzent; PRIYMAK, I.A., prof., red.; AVRUTSKAYA, R.F., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Planning and economics of metallurgical plants] Planirovanie i ekonomika metallurgicheskikh zavodov. Izd.2., dop. i perer. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1960. 736 p. (MIRA 13:2)
(Metallurgical plants)

[redacted], M.A., referent

Device for the quick replacement of roll stands on continuous shape rolling mills. [from "Stahl and Eisen," no.16, 1960; "Blast Furnace and Steel Plant," no. 10, 1960]. Biul. TSIIOMN no.5:57-58 '61. (MIRA 14:10)
(Rolling mills—Equipment and supplies)

KARPMAN, M.A., referent

New mill for pipe reduction with elongation [from "Iron and Steel Engineer," no.7, 1960]. Biul. TSIICHM no.1:55-56 '61.
(MIRA 14:9)
(Mexico--Pipe mills)

ROKOTYAN, Ye.S., doktor tekhn.nauk, prof.; ZHUKEVICH-STOSHA, Ye.A.; SOLOV'YEV, O.P.; LYAMIN, G.N.; SAPOZHNIKOV, A.Ya.; LIPUKHIN, V.A.; KOGOS, A.M.; ISTOMIN, A.V., retsenzent; KARPMAN, M.A., nauchn. red.; PODCHUFAROVA, S.I., red.; KOGAN, [illegible], tekhn. red.

[Modern rolling mills abroad] Sovremennye prokatnye stany za rubezhom. Moskva, 1962. 419 p. (MIRA 16:8)

1. Moscow. TSentral'nyy institut nauchno-tekhnicheskoy informatsii mashinostroyeniya.

(Rolling mills)

L 28512-66 EWT(l)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6016595 (A) SOURCE CODE: UR/0129/66/000/005/0055/0057

AUTHORS: Benediktova, G. P.; Dubinin, G. N.; Karpman, M. G.; Shcherbedinskiy, G. V.

ORG: MAI, TsNIIChERMET

62
B

TITLE: Diffusion of potassium in mono- and polycrystalline molybdenum

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1966, 55-57

TOPIC TAGS: potassium, molybdenum, metal diffusion, physical diffusion, temperature dependence, polycrystal

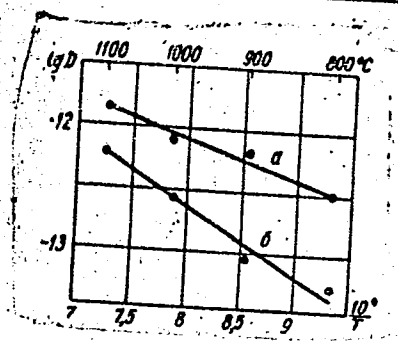
ABSTRACT: The diffusion of potassium into mono- and polycrystalline molybdenum at a number of temperatures (800, 900, 1000, and 1100C) was studied. The experiments were carried out by exposing mono- and polycrystalline specimens of Mo to molten KCl or metallic K containing radioactive K^{42}. The diffusion coefficients were determined from the concentration distribution of K^{42} in the surface layers of the specimens. The experimental results are presented in graphs and tables (see Fig. 1). The diffusion coefficients for diffusion into mono- and polycrystalline molybdenum obeyed the relationships

$$D = 9{,}34 \cdot 10^{-9} e^{-\frac{25\,800}{RT}} \text{ [cm}^2\text{/sec]};$$

$$D = 2{,}66 \cdot 10^{-10} e^{-\frac{14\,600}{RT}} \text{ [cm}^2\text{/sec]},$$

Card 1/2 UDC: 539.12.172:669.24'28

Fig. 1. Temperature dependence of the diffusion coefficients for the diffusion of potassium into molybdenum: a - polycrystal, b - monocrystal.



respectively. It is noted that the derived diffusion coefficients differ from those obtained by I. Cornides (Naturwissenschaften, 1958, v. 45, No. 6) by four orders of magnitude. Orig. art. has: 1 table and 2 figures.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 006

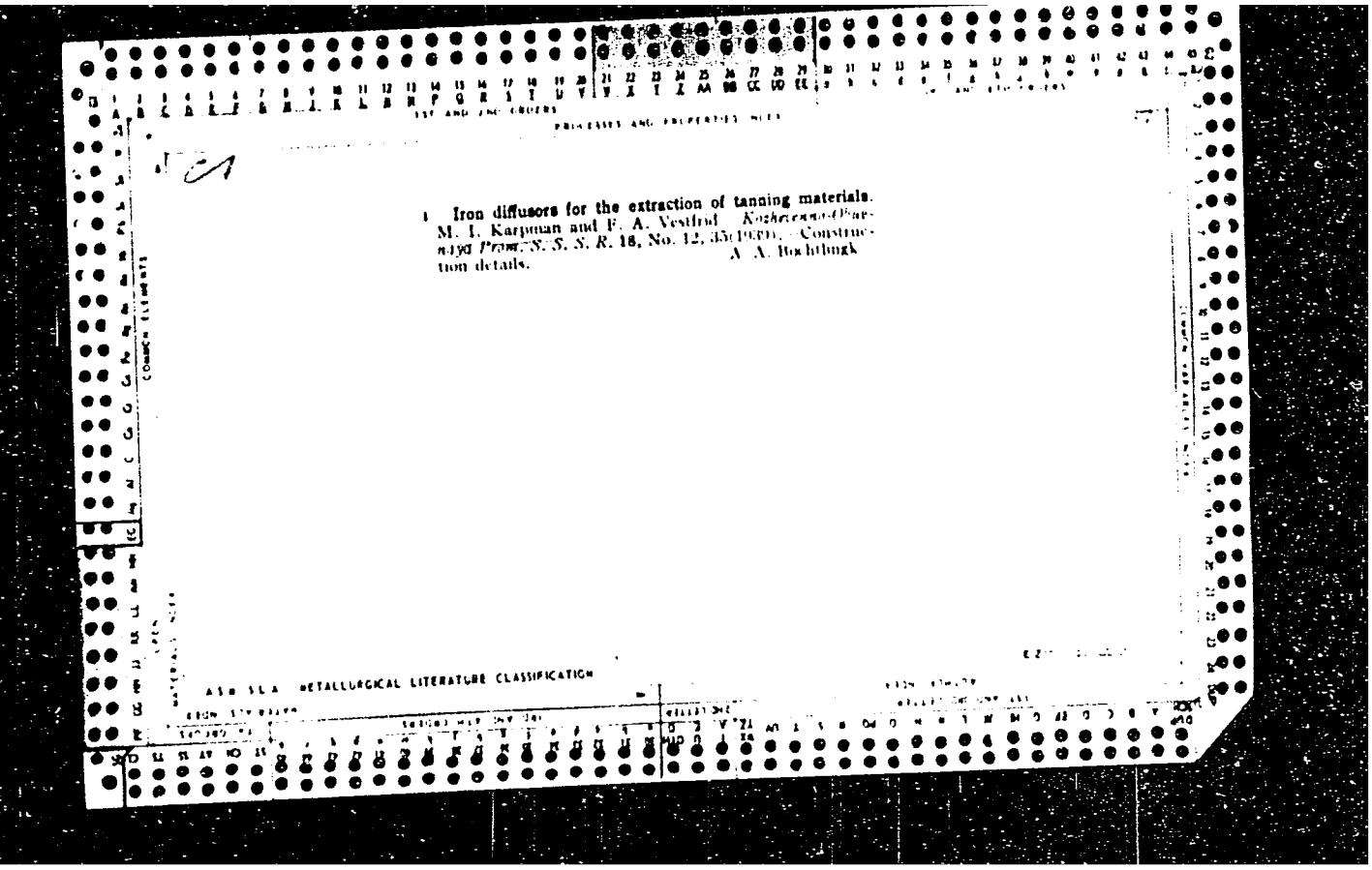
ZHIL'TSOV, A.A.; KARPMAN, M.I.

Over-all mechanization of the piling of bark. Kozh. obuv. prom. 5 no.7:12-14 Jl '63. (MIRA 16:8)

(Tanning materials) (Materials handling)

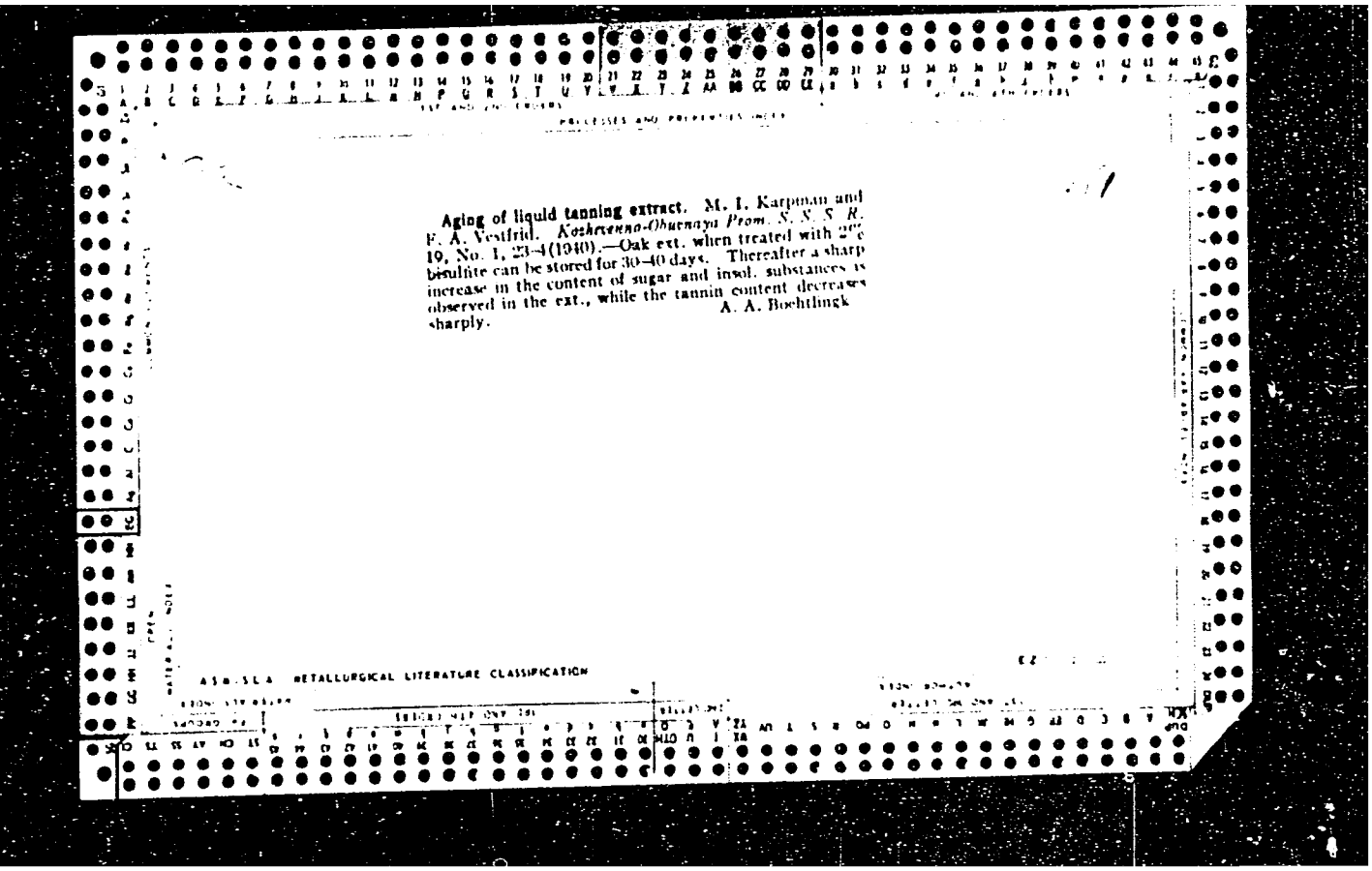
KARPMAN, M.I., kand.tekhn.nauk

Equipment for the loading and conveying of freight. Mekh.i avtom.proizv. 17 no.7:34-35 Jl '63. (MIRA 16:8)
(Motor trucks)



Iron diffusors for the extraction of tanning materials. M. I. Karpman and F. A. Vestfrid. *Kozhevenno-Obuvnaya Prom. S. S. S. R.* 18, No. 12, 35(1959). Construction details. A. A. Bochtlingk

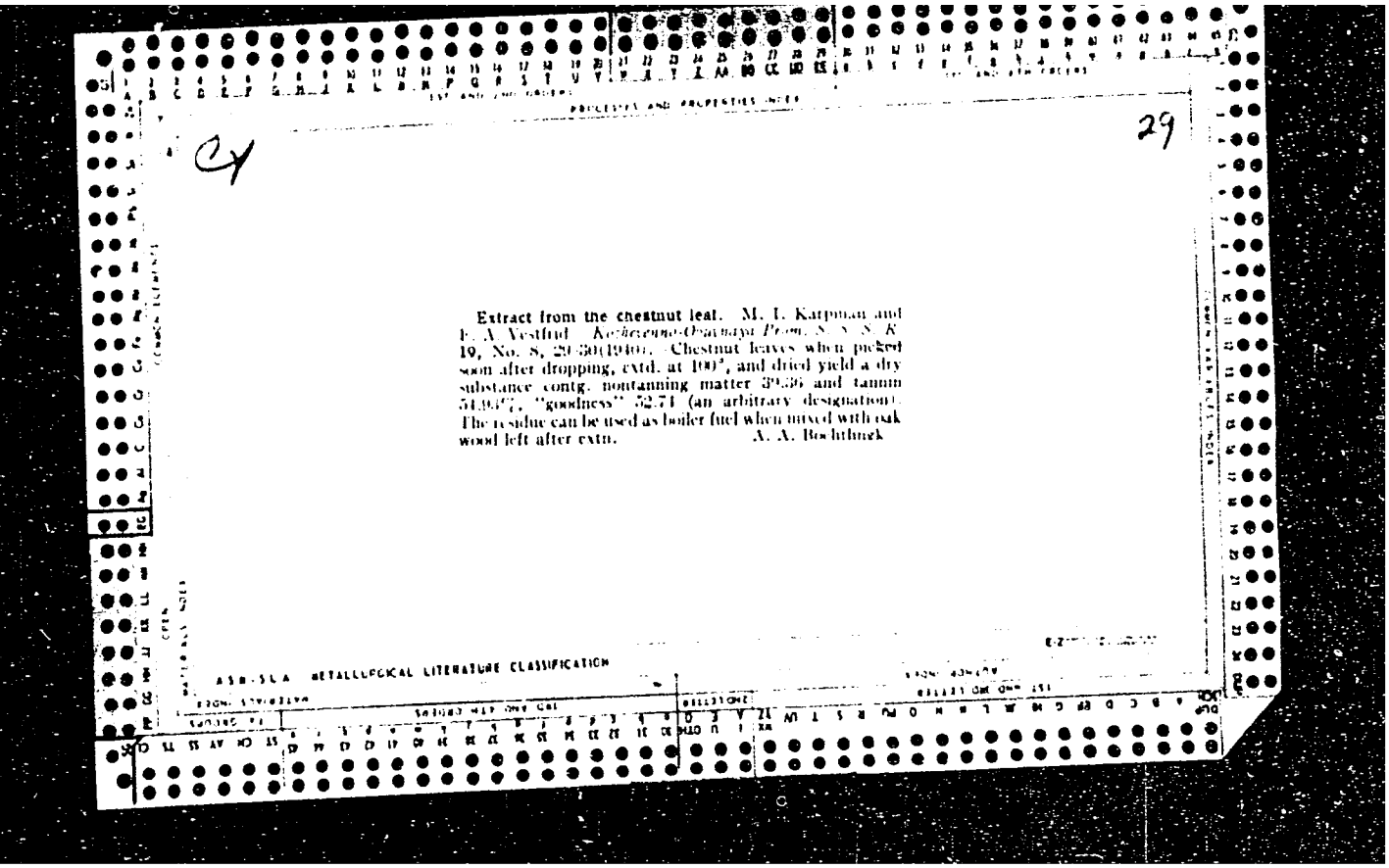
ASM SLA METALLURGICAL LITERATURE CLASSIFICATION



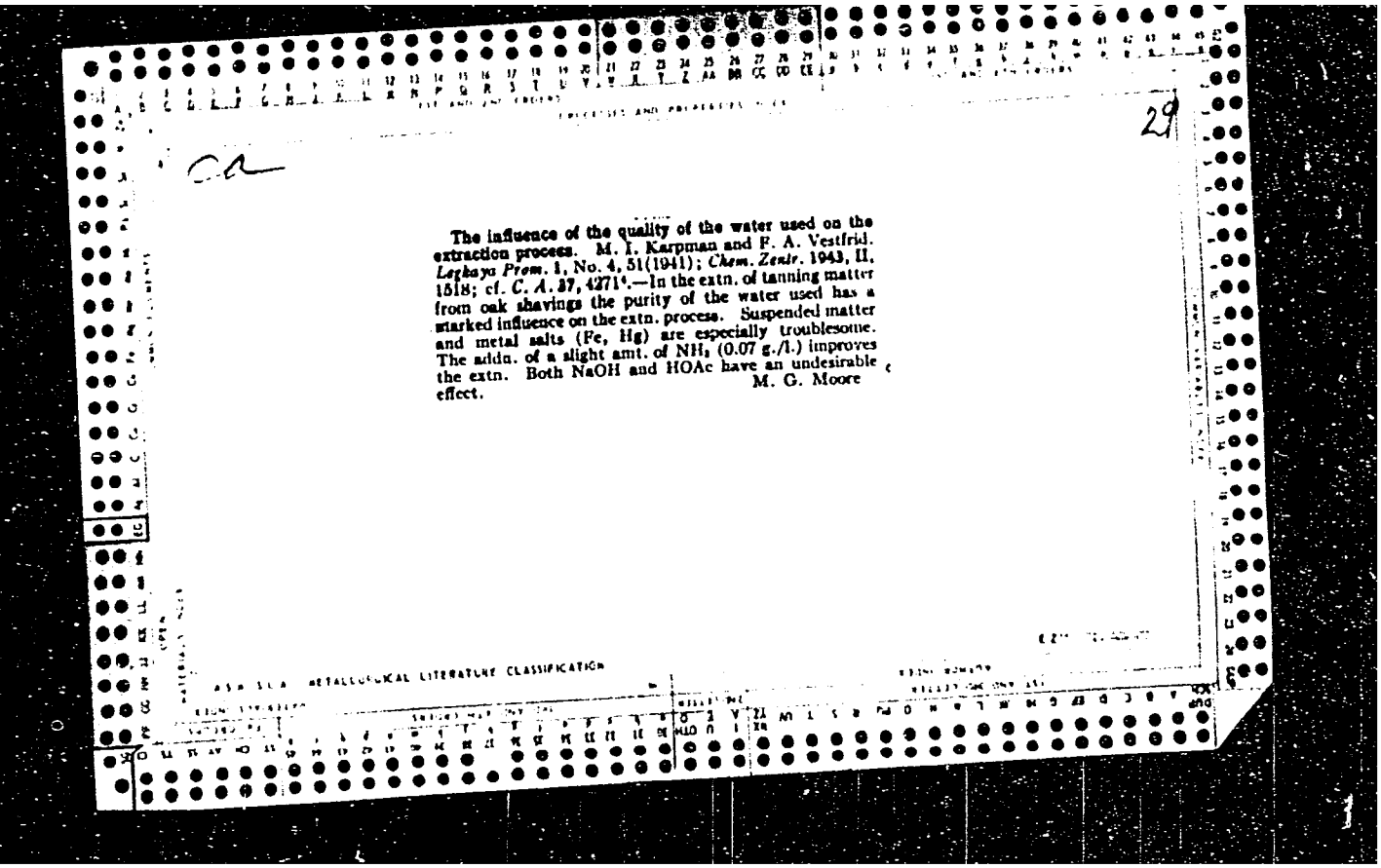
Aging of liquid tanning extract. M. I. Karpman and F. A. Vestfrid. *Kozhevenno-Obuvnaya Prom., S. S. S. R.* 19, No. 1, 23–4 (1940).—Oak ext. when treated with 2% bisulfite can be stored for 30–40 days. Thereafter a sharp increase in the content of sugar and insol. substances is observed in the ext., while the tannin content decreases sharply.

A. A. Boehtlingk

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION



Extract from the chestnut leaf. M. I. Karpman and E. A. Vestfud. *Kozhevenno-Obuvnaya Prom. S.S.S.R.* 19, No. 8, 29-30(1940). Chestnut leaves when picked soon after dropping, extd. at 100°, and dried yield a dry substance contg. nontanning matter 3.36 and tannin 51.04%, "goodness" 52.71 (an arbitrary designation). The residue can be used as boiler fuel when mixed with oak wood left after extn. A. A. Bochinek



29

The influence of the quality of the water used on the extraction process. M. I. Karpman and F. A. Vestfrid. *Legkaya Prom.* 1, No. 4, 51(1941); *Chem. Zentr.* 1943, II, 1518; cf. *C. A.* 37, 4271⁶.—In the extn. of tanning matter from oak shavings the purity of the water used has a marked influence on the extn. process. Suspended matter and metal salts (Fe, Hg) are especially troublesome. The addn. of a slight amt. of NH_3 (0.07 g./l.) improves the extn. Both NaOH and HOAc have an undesirable effect.
M. G. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KARPMAN, M.I.

Quality of tanning raw material. Leg.prom. 7 no.8:27-28 Ag '47.
(MLRA 6:11)
(Tanning)

KARPMAN, M.I., kandidat tekhnicheskikh nauk.

Method of improving the properties of oak tannin. Leg.prom. 7 no.9:21-22 Ag '47. (MLRA 6:11) (Tannins)

CA

21

Component parts of tanning extract. M. I. Karpman. *Izdatel'stvo Prom.* 9, No. 1, 19-20(1949). Analysis of dry and liquid oak, spruce, and willow exts. indicates that upon evapn. to dryness, there is an increase in tannins and a decrease in nontannins. B. Z. Kanuch

CA

13-H

Preservation of oak extract. M. I. Karpetan and V. A. Zotov. *Legkaya Prom.* 11, No. 6, 43(1951). Satisfactory preservatives in open storage are 2% β-naphthol, 0.5% HgI_2, and 1% chloramine by wt. of the liquid ext. The HgI_2 is mixed with an equal amt. of KI before adding. Preservation with *p*-dichlorobenzene, Na_2SO_3, chloroform, formalin, xylene, and DDT proved unsatisfactory. In air-tight containers, satisfactory preservatives are β-naphthol 0.25, HgI_2 0.1, Na_2SO_3 1, HCHO 0.3, and chloramine 1% by wt. of liquid ext.

B. Z. Kamich

KARPMAN, M.I., kand.tekhn.nauk.

Using ion exchanging substances in the production of tanning extracts. Leg.prom. 17 no.8:37-38 Ag '57. (MIRA 10:10)
(Tanning materials) (Ion exchange)

KARPMAN, M.I.

KARPMAN, M.I., kand. tekhn. nauk.

Increasing the extraction of tannides from vegetable raw materials.
Leg. prom. 17 no.12:27-29 D '57. (MIRA 11:1)
(Tannins)

KARPMAN, M.I., kand.tekhn.nauk.

Swelling of willow and spruce rind during extraction. Leg.prom. 18 no.7:51-52 Jl '58. (MIRA 11:9)
(Tanning materials)

SVIRIN, P.M.; KARPMAN, M.I.

Production of vegetable tanning extracts. Kozh.-obuv. prom. no.8:22-24 Ag '59. (MIRA 13:1)
(Tanning materials)

FRENKEL', P.Ya.; KRASUKHIN, M.N.; VOLKOV, N.V.; KARPMAN, M.I.; MAYOROVA, Ye.I.

Using the ion exchange method for refining tanning bark extracts. Kozh.-obuv.prom. 2 no.7:28-30 Jl '60. (MIRA 13:8)
(Tanning materials) (Ion exchange)

VOLKOV, N.V.; KARPMAN, M.I.; SVIRIN, P.M.

Effect of storage conditions on the quality of willow bark.
Kozh.-obuv. prom. 2 no. 11:30-31 N '60. (MIRA 13:12)
(Tanning materials)

VOLKOV, N.V.; KARPMAN, M.I.

Extraction of tannin from willow bark with sodium sulfite.
Kozh.-obuv.prom.3 no.3:32-33 Mr '61. (MIRA 14:6)
(Tannins) (Sodium sulfite)

KARPMAN, M.I., kand.tekhn.nauk

"Rifan" test paper. Kozh.-obuv.prom. 3 no.7:29-30 Jl '61.
(MIRA 14:9)

(Indicators and test papers) (Tanning materials--Testing)

KARPMAN, M.I., kand.tekhn.nauk

Electromagnetic system for scale control. Kozh.-obuv.prom. 3 no.9:35-36 S '61. (MIRA 14:11)
(Feed-water purification)

KARPMAN, M.I., kand.tekhn.nauk

Experience in the storage of crushed willow bark. Kozh.-obuv.prom. 4 no.1:37 Ja '62. (MIRA 15:3)
(Tanning materials--Storage)

KARPMAN, M.I., kand.tekhn.nauk

Manufacture of hardboard from spent tanning bark. Kozh.-obuv. prom. 4 no.12:12 D '62. (MIRA 16:1)
(Bark) (Hardboard)

KARPMAN, M.I., kand.tekhn.nauk

Electromagnetic treatment of diffusion juices. Kozh.-obuv.prom. 5 no.10:33-34 O '63. (MIRA 17:4)

KARPMAN, M.I., kand. tekhn. nauk

Use of ferments in the production of tanning extracts. Kozh.-obuv. prom. 6 no.4:33 Ap'64. (MIRA 17:5)

KARPMAN, M.I., kand.tekhn.nauk

Utilization of the water squeezed out during the pressing of bark bin waste. Kozh.-obuv. prom. 7 no.3:1 Mr '65.
(MIRA 18:10)

KARPMAN, V. I.

333

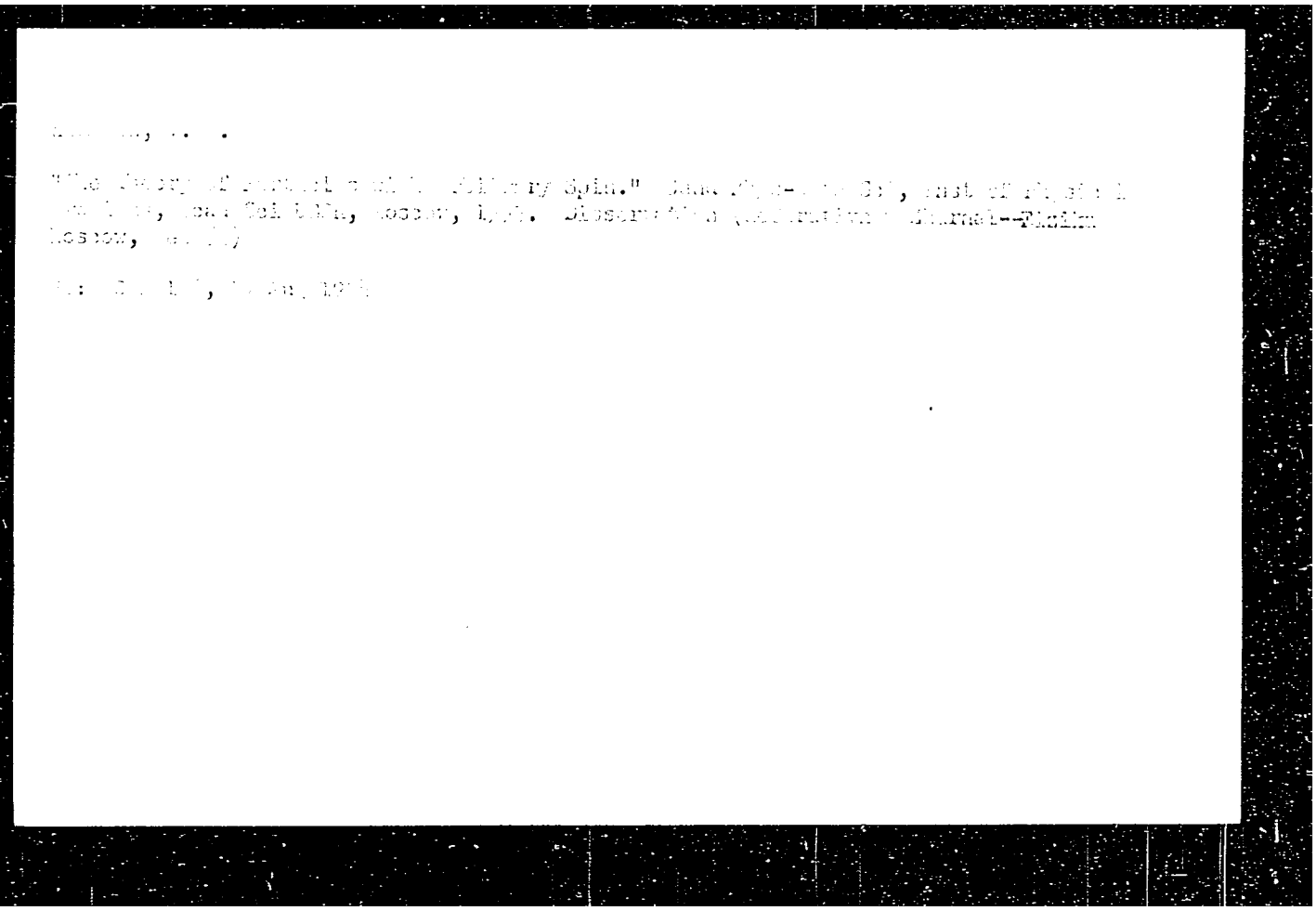
Kerpman, V. I. Quantization of wave fields with a finite number of components. Akad. Nauk SSSR. Zurnal Eksper. Teoret. Fiz. 21, 1337–1349 (1951). (Russian)

The author's purpose is to derive the Pauli relationship between spin and statistics for a general quantized relativistic field theory [Pauli and Belinfante, Physica 7, 177–192 (1940); these Rev. 1, 279]. He considers a general field with a finite number of components, satisfying a matrix wave equation

$$L^l(\partial/\partial x^l)\psi + ik\psi = 0.$$

He explains in detail how the general solution of the wave-equation can be found, he computes the total energy and charge in the field, and he quantizes the field in the usual way. The requirement that measurable quantities at two field-points separated by a space-like interval commute leads to the relation between spin and statistics. This paper adds nothing to the discussion given in the cited paper of Pauli and Belinfante. *F. J. Dyson* (Ithaca, N. Y.)

Source: Mathematical Reviews, Vol 13 No. 7



KARPMAN, V. I.

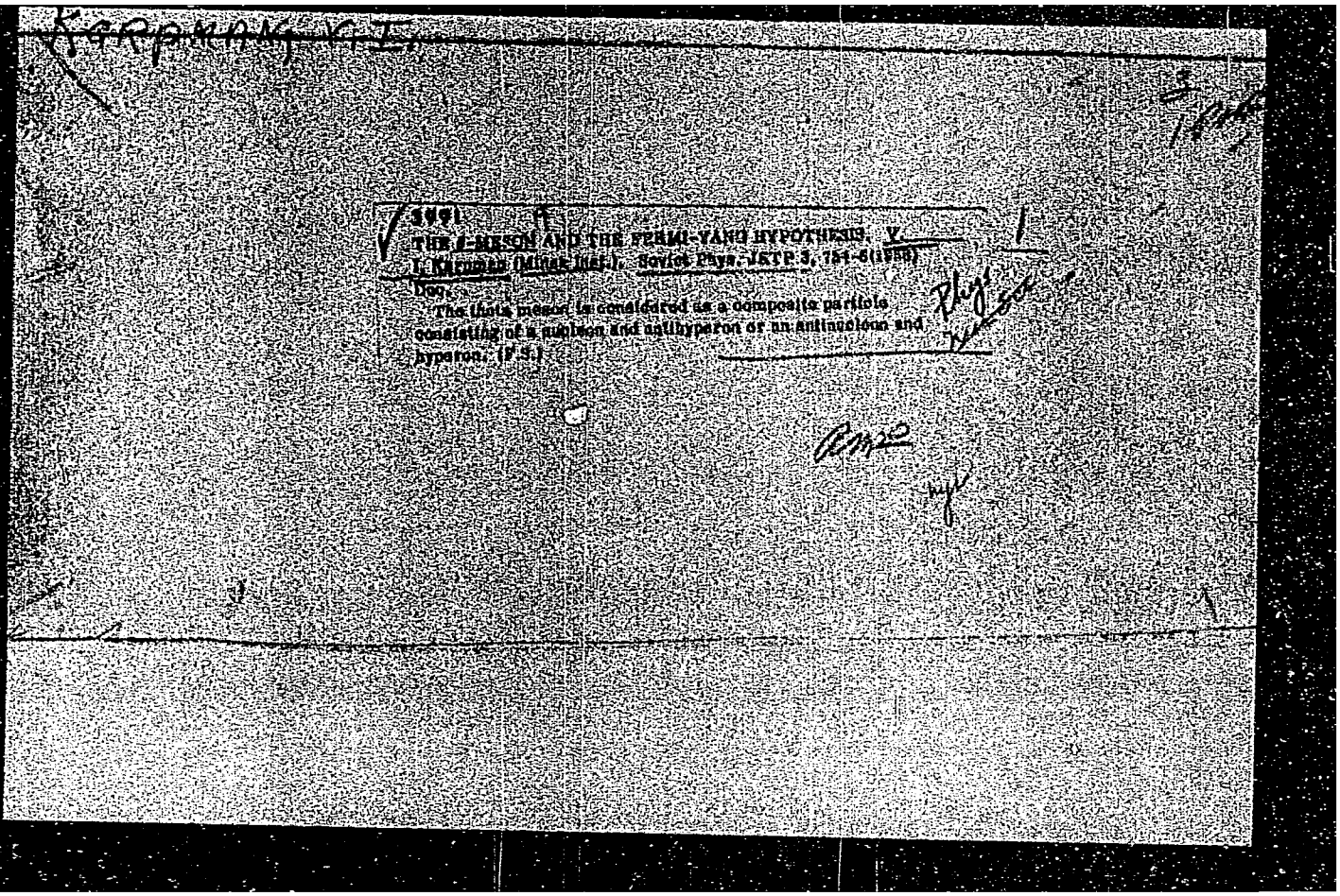
Mathematical Reviews
Vol: 15 No. 4
Apr. 1954
Mathematical Physics

8-24-54

Karpman, V. I. On a connection between the method of regularization and theories of particles with arbitrary spin. Doklady Akad. Nauk SSSR (N.S.) 89, 257–260 (1953). (Russian)

It is shown that it is not possible to identify the auxiliary masses used in the regularization method of Pauli and Villars [Rev. Modern Physics 21, 434–444 (1949); these Rev. II, 301] with the masses of particles of arbitrary spin described by equations of the type $(L^k\nabla_k+i\kappa)\psi=0$.

E. Gora (Providence, R. I.).



3491
THE K-MESON AND THE FERMI-YANG HYPOTHESIS. V.
T. Kitagaki (Mitsui Inst.). Soviet Phys. JETP 3, 751-6(1956)
Engl.
The (fluid) meson is considered as a composite particle consisting of a nucleon and antihyperon or an antinucleon and hyperon. (P. S.)

Karpman V. I.

USSR/Nuclear Physics - Elementary Particles C-3

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33941

Author : Karpman, V I.

Institution : Minsk Pedagogical Institute, Minsk, USSR

Title : The θ-Meson and the Fermi-Yang Hypothesis

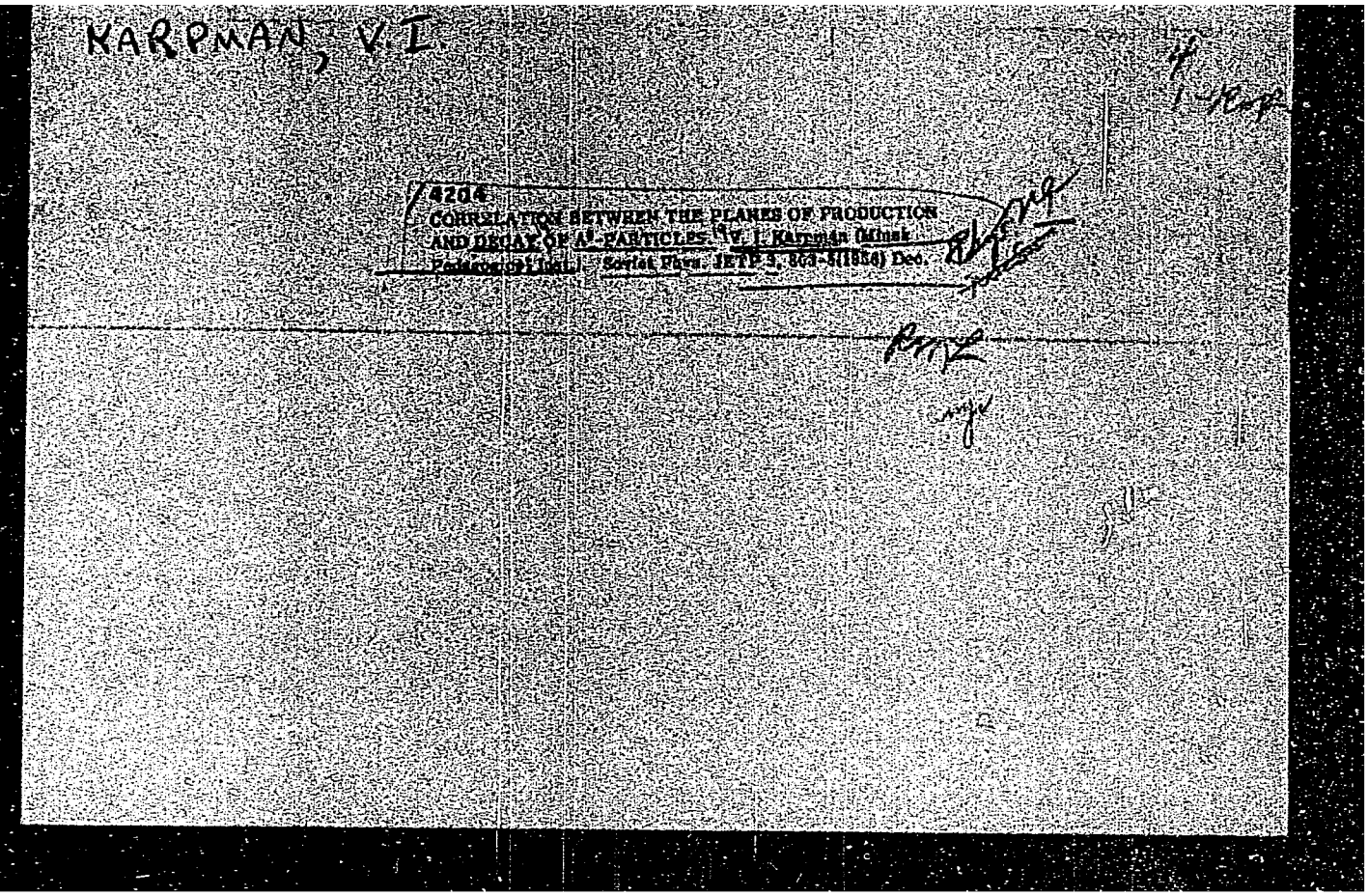
Original Periodical : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 781-782

Abstract : Several consequences, resulting from representing the θ-meson as a compound particle, consisting of a nucleon and hyperon (θ^0 = N + [Λ], θ^+ = P + [Λ], θ^- = [P] + Λ) (brackets denote the antiparticle) are indicated. If, in accordance with the known correlation experiments, it is assumed that the Λ-particles have a spin greater than 1/2, then the spin of the θ-meson from this point of view should differ from zero. Also indicated is the possibility of the existence of particles θ_1 = nucleon + [Σ],

Card 1/2

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33941

with isotopic spin 1/2 or 3/2, which, thanks to the "strong" or electromagnetic interaction (using the Gell-Mann terminology), should "rapidly" convert into a θ-meson with emission of a π-meson or a γ-quantum.



KARPMAN, V. I.

Category : USSR/Nuclear Physics - Elementary Particles C-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3150

Author : Karpman, V.I.
Inst : Minsk Pedagogical Institute
Title : Correlation Between the Planes of Production and Decay of Λ^0 Particles

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 5, 963-964

Abstract : A study is made of the distribution function of the angle φ between the planes of production and decay of Λ^0 particles as functions of their spin. It is shown that if the spin of the Λ^0 is 3/2, the probability that $\varphi > 45^o$ cannot be less than 18%, and the probability of $22.5^o \leq \varphi \leq 67.5^o$ should be 50%. These values do not contradict the experimental data available at the present time. It is also shown that the correleation would be impossible (independently of the spin of the Λ^0 particle) were the θ^0 particle that is produced together with the Λ^0 particle to have a zero spin. Therefore, the correlation between the planes of formation and decay of the Λ^0 particle indicates that the spin of the θ^0 is not zero.

Card : 1/1

KARPMAN, V.I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1410
AUTHOR KARPMAN, V.I.
TITLE On the Scattering Matrix for a Particle with Any Spin.
PERIODICAL Žurn.eksp.i teor.fis, 30, fasc.6, 1104-1111 (1956)
Issued: 8 / 1956 reviewed: 10 / 1956

Here it is shown how it is possible to determine the elements of the S-matrix for particles with any spin in HEISENBERG'S representation by the method developed by C.N.YANG and D.FELDMAN, Phys.Rev. 79, 972 (1956). For reasons of simplification interaction with the electromagnetic field is studied here. Interaction with other fields is dealt with in the same manner.
The equation for a particle which is in interaction with an electromagnetic field can be written down as follows:
$(L_k \nabla_k + i\varkappa)\Psi = ieA_k L_k \Psi$; $\Box A_k = j_k$; $j_k = e(\bar{\Psi} L_k \Psi)$. Here it is true that $\hbar = c = 1$; $k = 0,1,2,3$; $\nabla_k = \partial/\partial x_k$; $\Box = \nabla_k$. A_k denotes the quantized four-vector potential of the electromagnetic field and L_k - a matrix studied by I.M.GEL'FAND and A.M.JAGLOM, Žurn.eksp.i teor.fis, 18, 1096, 1105 (1948). For the matrix L_k yet another identity is given which, for particles with spin 1/2, passes over to the known relations for the DIRAC matrices, and for particles with spin 0 or 1 to the relations of DUFFIN-KEMMER.
Next, the most important singular functions which correspond to the aforementioned equation are investigated. Expressions for the singular function of

Žurn.eksp.i teor.fis,30,fasc.6,1104-1111 (1956) CARD 2 / 2 PA - 1410

PAULI, and above all for GREEN'S function are given. Both in the case of GREEN'S function and in that of the commutator relations as well as in the case of other values averaged over the vacuum one and the same differential operator $S(\nabla)$ acts just as is the case in quantum electrodynamics. Also among the various GREEN'S functions the same conditions apply as in quantum electrodynamics. However, for particles with spin 1/2 an essential difference from what is the case in quantum electrodynamics is pointed out.

If GREEN'S function is known, the first-mentioned equation may be solved by successive approximations. For this purpose this equation is best replaced by the integral equation which is its equivalent, and retarded or advanced potentials are used.

Next, a method for the determination of the matrix elements of the S-matrix is discussed step by step. This method requires voluminous computations, but also in this case the form of the matrix elements corresponds to the rules set up by FEYNMAN-DYSON. In conclusion attention is drawn to the work by S.N.GUPTA, Phys. Rev.95, 1334 (1954), which was published after these results had been obtained. The results obtained by GUPTA are contained in the present work as a special case.

INSTITUTION: State Pedagogic Institute of MINSK.

KARPMAN, V.I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1866
AUTHOR KARPMAN,V.I., FISER,I.Z.
TITLE On the Annihilation of Positrons in Metals.
PERIODICAL Dokl.Akad.Nauk, 111, fasc.6, 1212-1214 (1956)
Issued: 2 / 1957

The present work shows that the correct computation of the life of a positron annihilated immediately on free electrons leads to a fully satisfactory agreement with experimental data. However, the production of a positron in a metal is very improbable. The presence of numerous free electrons must cause strong screening of the COULOMB field of any positive charge introduced into the metal. For a positron that lives in the metal for $\sim 10^{-10}$ sec, screening may be considered to be equilibrium-like. In a metal the production of a positron such as it exists in the vacuum is impossible. Besides, the bound states of an electron in a COULOMB field, that is so strongly screened, are probably entirely impossible. Therefore the annihilation of the positron without production of a positronium probably takes place immediately on one of the free electrons. The possibilities for the annihilation of the positron on the electrons of atomic rests can be neglected. As the slow electrons play the most important part on the occasion of the annihilation, interaction between the electron and the positron must by all means be taken into account and this interaction can approximatively be considered to be purely COULOMB-like. By taking this interaction into account we obtain the following annihilation cross section:
$\sigma = (2\pi^2 r_0^2 c^2 \alpha / v^2) \left[1 - \exp(-(2\pi\alpha c/v))\right]^{-1}$; $\alpha = 1/127$. However, the exponent in

KARPMAN, V.I.

4209

ON THE S-MATRIX FOR PARTICLES WITH ARBITRARY SPIN. V. I. Karpman (Moscow State Pedagogical Inst.). Soviet Phys. JETP 5, 814-40(1957) Jan.

A discussion is given of the perturbation theory for particles with arbitrary spin. The properties of the singular functions for such particles are discussed. It is shown that the elements of the S-matrix may be found by the Feynman rules. (auth)

KARPMAN-V.I.

56-4-45/52

AUTHOR KARPMAN, V.I.

TITLE On the Theory of the "Strange" Particles.
(K teorii 'strannykh' chastits.- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 4, pp 939-940 (USSR)

ABSTRACT Good experimental confirmation exists of the scheme devised by Gell-Mann, but it must be supplemented by an interpretation of the quantum number S'strangeness'. Among the different attempts of interpretation of the strangeness, the mathematical formulation of the Gell-Mann scheme as proposed by B. d'Espagnat and J. Prentki, Phys. Rev., Vol 99, pp 328, 1955; ibid. Vol 1o2, Nr 1684 (1956), commands particular attention. According to this proposal, it is possible to describe the particles of half-total isotopic spin in the isotopic spin by spinors of the first and of the second kind, which differ from each other at an inversion in the isotopic space. The former are multiplied by +i(-i), the latter by -i(+i). The corresponding particles are called isofermions (nucleons, θ-particles, anti-Ξ-particles) and antiisofermions (antinucleons, anti-θ-particles, and $\bar{\Xi}$-particles). In this context, also the following postulate is given: The Lagrange function of the strong and of the electromagnetic interactions

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On the Theory of the 'Strange'Particles

(according to the terminology employed by Gell-Mann) is invariant with respect to an inversion in the isotopic space. From these presuppositions there follows the invariance of the Lagrange function with respect to simultaneous phase change and change of the wave functions of all isofermions and all antiisofermions: $\varphi \rightarrow \varphi e^{i\alpha}$, $\varphi' \rightarrow \varphi' e^{-i\alpha}$. In this context, α and α' stand for the wave functions of all isofermions and antiisofermions, respectively. From this we obtain the law of the conservation of the 'isofermionic charge' u which equals the number of the isofermions minus the number of the antiisofermions. The nucleonic charge n is conserved at all interactions, whereas u is preserved only at strong interactions and at electromagnetic interactions. Then the following formulae are obtained: $Q = I_3 + (u/2)$ and $S = u - n$; here Q denotes the electrical charge, and I_3 the projection of the isotopic spin. Thus the strangeness is interpreted as the difference of the isofermicnic charge and the nucleoonic charge. Finally, the author of the paper under review makes some remarks abouth the theory proposed by d'Espagnat and Prentki. From the point of view of this theory, the different

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B006/B056

24.4500
AUTHOR: Karpman, V. I.

TITLE: A Microscopic Theory of the Fermi Fluid

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1(7), pp. 185-188

TEXT: Many attempts have been made to develop a microscopic theory of the Fermi fluid based upon the general theory by L. D. Landau. The most important results were obtained by Landau himself. He defined the function $f(\vec{p},\vec{p}')$, which plays the main part in the theory of the Fermi fluid, exactly in the microscopic sense, and gave the formula

$$\delta\varepsilon_p = \mathrm{Sp}_\sigma \int f(\vec{p},\vec{p}')\delta n(\vec{p}')d\tau'$$

for the quasi-particle energy variation with an infinitely small variation of the distribution function n(p). Further, $\varepsilon_p = \delta E/\delta n(p)$, (2). On the other hand, in the general theory of many-particle quantum systems, energy and damping of the Fermi excitations of the system (quasi-particles, holes) for momenta near the limiting momentum is given in momentum representation by the poles of the single-particle

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39487
S/056/62/043/002/021/053
B104/B108

44 3120

AUTHORS: Zakharov, V. Ye., Karpman, V. I.

TITLE: Non-linear theory of attenuation of plasma waves

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 490-499

TEXT: The non-linear interaction of a plasma with monochromatic Langmuir waves and their attenuation are investigated. Waves with sufficiently small amplitudes are considered only: $e\bar{\varphi}/T \ll 1$, where $\bar{\varphi}$ is the amplitude of the wave-field potential, and T is the plasma temperature. The kinetic equation

$$\frac{\partial f}{\partial t} + v\frac{\partial f}{\partial r} - \frac{e}{m}\frac{\partial \Phi}{\partial r}\frac{\partial f}{\partial v} = -\mathrm{St}(f), \qquad (6)$$

with the linearized collision integral

$$\mathrm{St}(f) = -\frac{L\omega_0^4}{4\pi n}\frac{\partial}{\partial v_i}\left\{\frac{1}{v^3}\left[v_i f + \left(v^2\delta_{ik} - v_i v_k - \frac{T}{m}\frac{v^2\delta_{ik} - 3v_i v_k}{2v^2}\right)\frac{\partial f}{\partial v_k}\right]\right\}, \qquad (9)$$

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Non-linear theory of attenuation ...

furnishes

$$f_0^{\pm}(\varepsilon) = A \exp\left[-\varepsilon \mp \tfrac{1}{2} c\pi \varphi_0^{-1/2}(\varepsilon - \varphi_0)\right], \quad (\varepsilon - \varphi_0)/\varphi_0 \ll 1,$$

$$f_0^{\pm}(\varepsilon) = A \exp\left[-\varepsilon \mp 2c\varepsilon^{1/2}\right], \quad \varepsilon \gg \varphi_0; \qquad (24a+b)$$

$$A = (n/\sqrt{2\pi}\, v_T)\, e^{-c^2}.$$

for the electron distribution function in the outer region and

$$f(\varepsilon, y) = f_0(\varepsilon)\, e^{-\nu c y}, \quad f_0(\varepsilon) = (ne^{-c^2}/\sqrt{2\pi}\, v_T)\, e^{-\varepsilon} + O(\varphi_0), \qquad (26)$$

for that in the inner region. The damping decrement is found to be

$$\gamma = \frac{12\alpha}{\tau_D}\left(\frac{v_f}{v_T}\right)^4 \exp\left(-\frac{v_f^2}{2v_T^2}\right)\left(\frac{e\Phi_0}{T}\right)^{-1/4}; \quad \alpha = \frac{7\pi + 6}{16\sqrt{\pi}}. \qquad (42)$$

Notations: v_T is the thermal velocity of the electrons, n is the plasma density, ω_0 is the Langmuir frequency, and v_f is the phase velocity of the waves. There are 2 figures.

SUBMITTED: January 14, 1962

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KARPMAN, V.I. (Novosibirsk)

Theory of a turbulent plasma in a magnetic field. PMTF no. 6:34-41 N-D '63. (MIRA 17:7)

KARPMAN, V.I.; SAGDEYEV, R.Z.

Structural stability of a shock wave front moving across a magnetic field in a rarefied plasma. Zhur. tekh. fiz. 33 no.7:805-814 Jl '63. (MIRA 16:9)

1. Novosibirskiy gosudarstvennyy universitet.

(Shock waves) (Plasma (Ionized gases)) (Magnetic fields)

L 18473-63 EPR/EPA(b)/EWT(1)/EWG(k)/BDS/EEC(b)-2/ES(w)-2 AFFTC/ASD/
AFWL/ESD-3/IJP(C)/SSD Ps-4/Pd-4/Pz-4/Pab-4/Pi-4/Po-4 AT/WW
ACCESSION NR: AP3003803 S/0057/63/033/003/0359/0366

AUTHOR: Kartsman, V. I.

93
91

TITLE: Structure of a shock front propagating obliquely to the magnetic field in a rarefied plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v.33, no.3, 1963, 359-366

TOPIC TAGS: plasma, shock front

ABSTRACT: The structure of a shock-wave front propagating obliquely to a strong magnetic field in a cold rarefied plasma (gas pressure negligible compared with the magnetic pressure) is calculated on the basis of the "equations of magnetohydrodynamics with ionic dispersion." These are the usual magnetohydrodynamic equations for a cold plasma with collisions taken into account by a finite conductivity term (collision frequency assumed small compared with the ion cyclotron frequency) and with the "ionic dispersion term" -curl((curl H)H/n)c/4πe included in the expression for the time derivative of the magnetic field H. This term gives rise to dispersion effects at frequencies of the order of the ion cyclotron frequency. These equations are said to be adequate for the description of phenomena at frequencies

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ACCESSION NR: AP3005580

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that are low compared with the geometric mean of the ion and electron cyclotron frequencies and with the ion Langmuir frequency. The shock front is assumed to be weak (velocity change small compared with the velocity) and to propagate at an arbitrary angle (which, however, is finitely bounded from 0° to 90°) to the magnetic field. It is found that if the collision frequency is sufficiently high the shock front is [illegible], but that it has a periodic structure for low collision frequencies. Conditions are obtained for the appearance of the periodic structure, and expressions for the frequency and damping of the oscillations are derived. In the periodic case the shock front begins with small oscillations which develop into a series of isolated "rarefaction" waves that bring the magnetic field to its final value. This evolution is the reverse of that [illegible] by R. Z. Sagdeyev (ZhTF, 31, 1956, [illegible]) for shock fronts propagating transversely [illegible] magnetic field. This difference [illegible] to the fact that different [illegible] mechanisms are effective in [illegible]. "I take the occasion to thank [illegible] for fruitful discussions of the [illegible]." Orig. art. has: 32 formulas [illegible].

ASSOCIATION: [illegible] gosudarstvennyy universitet ([illegible] State University)

SUBMITTED: [illegible] DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: [illegible] NO REF SOV: 004 OTHER: 006

Card 2/2

GALEYEV, A.A.; KARPMAN, V.I.

Turbulent theory of a weakly nonequilibrium rarefied plasma and the structure of shock waves. Zhur. eksp. i teor. fiz. 44 no.2:592-602 F '63. (MIRA 16:7)

1. Novosibirskiy gosudarstvennyy universitet.

S/056/63/044/004/027/044
B102/B186

AUTHOR: Karpman, V. I.

TITLE: Nonlinear effects in the electrodynamics of a transparent medium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 4, 1963, 1307 - 1316

TEXT: In analogy to a previous paper (ZhETF, 44, 592, 1963) in which the nonlinear interaction between waves in a plasma exposed to a strong magnetic field was investigated, here the interaction of electromagnetic waves in an arbitrary transparent medium is investigated. The medium considered is assumed to be nonmagnetic, and the nonlinear effects are considered as being due only to a second-order term. The results obtained on the basis of the linearized solutions of the Maxwell equations read:

$$i\frac{dc_p}{dt} = \sum_{p',p''} V_{pp'p''} c_{p'} c_{p''} \exp\{i(\omega_p - \omega_{p'} - \omega_{p''})t\}, \qquad (29)$$

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Nonlinear effects in the...

$$V_{pp'p''} = -V^{-1/2}(16\pi\omega_p)^{-1}\sigma_{\alpha\beta\gamma}(\omega_{p'}, \omega_{p''})E^*_\alpha(p)E_\beta(p')E_\gamma(p'') \qquad (30)$$

при $p = p' + p''$, (30a)

$$V_{pp'p''} = 0 \quad \text{при } p \neq p' + p''.$$

where

$$V_{pp'p''} = V_{pp''p'}, \qquad V_{kk'k''} = V^*_{k''k'_-k'}$$

$$V_{pp'p''} = -V^*_{p_-p'_-p''_-}, \qquad V_{kk'k''_-} = -V^*_{k''_-k'_-k'}$$

The latter hold when $\omega_{\vec{p}} = \omega_{\vec{p}'} + \omega_{\vec{p}''}$ and $\vec{p} = \vec{k}, \vec{k}_-$ (the subscript minus denotes the negative value). As an example, Eq. (29) is employed to investigate the effect that when intense monochromatic light passes through a quartz crystal a second harmonic may arise. It can be shown that the intensity of the second harmonic will depend on the polarization of the incident ray when this ray is directed along y; when it is directed along z it is independent of the initial polarization and when the incident ray coincides with the x-axis no second harmonic will arise at all.

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ASSOCIATION: Novosibirskiy gosudarstvennyy universitet (Novosibirsk State University)

SUBMITTED: November 3, 1962

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KARPMAN, V.I.

Theory of weakly turbulent plasma. Dokl. AN SSSR 152 no.3:587-590 S '63. (MIRA 16:12)

1. Predstavleno akademikom M.A.Leontovichem.

KARPMAN,V.I. (Novosibirsk)

"On hydrodynamics of rarified plasma"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

ACCESSION NR: AP4044713 S/0207/64/000/004/0003/0009

AUTHOR: Karpman, V. I. (Novosibirsk)

TITLE: On damping plasma longitudinal oscillations of finite amplitude

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 4, 1964, 3-9

TOPIC TAGS: plasma oscillation, plasma wave, Boltzmann equation, boundary layer, kinetic theory, damping factor

ABSTRACT: The effect of weak collisions on finite amplitude plasma wave decay was studied analytically. Boltzmann's equation for distribution function f is written in the form

$$u\frac{\partial f}{\partial y}-\varphi'(y)\frac{\partial f}{\partial u}=\mu\frac{\partial}{\partial u}\left[\frac{\partial f}{\partial u}+(u+\alpha)f\right]$$

where

$$\varphi(y)=-\frac{e\Phi}{T},\quad y=kx,\quad \Phi(x)=\Phi_0\cos^2\frac{kx}{2}$$

$$\alpha=v_l\left(\frac{T}{m}\right)^{-1/2},\quad \mu=\frac{\delta}{2kv_T\tau_D},\quad \tau_D=\frac{m^2v_l^3}{8\pi e^4nL},$$

and it is assumed that $\mu \ll \varphi_0 \ll 1$. Furthermore, introducing δ, the nondimensional total energy of a particle in a wave field, the Boltzmann equation may be

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ACCESSION NR: AP4044713

written $\frac{\partial f}{\partial y} = \nu \frac{\partial}{\partial \varepsilon}\left[\pm \sqrt{\varepsilon - \varphi(y)}\left(f + \frac{\partial f}{\partial \varepsilon}\right) + cf\right]$

$c = \frac{a}{\sqrt{2}} = v_f \left(\frac{2T}{m}\right)^{-1/2}, \quad \nu = \sqrt{2}\mu = \frac{3}{\sqrt{2}\, k v_T \tau_D}$, whose solution can be obtained by a series expansion in ν, or $f(\varepsilon, y) = f_0(\varepsilon) + \nu f_1(\varepsilon, y) + \ldots$.

The solution is divided into three domains: external, $\mathcal{E} > \varphi_0$, internal with $\mathcal{E} < \varphi_0$ and boundary layer, $\mathcal{E} \sim \varphi$. This last domain is studied in some detail. Here it is assumed that variations in the distribution function are small and that consequently one obtains the equation $\frac{\partial f}{\partial y} = \pm \varphi_0^{1/2} \nu \cos \frac{y}{2} \frac{\partial^2 f}{\partial \varepsilon^2}$ whence the magnitude of the boundary layer is estimated to be $\delta \sim \varphi_0^{1/4} \nu^{1/2}$. The above equation is then solved for both positive and negative signs, and the damping of waves is estimated. The analysis is extended to the case and the distribution function expanded in powers of φ_0. The resulting kinetic equation takes a form analogous to the equations derived by A. Lenard and I. Bernstein (Plasma Oscillations with Diffusion in Velocity Space, Phys. Rev. 1958, v. 112, p. 1956). The final solution for oscillation damping leads to the linear theory of Landau, with Landau damping expression

$$\gamma = -\frac{\langle W \rangle}{E_0^2/8\pi} = \frac{\sqrt{\pi}}{2\sqrt{2}} \omega_0 \left(\frac{v_f}{v_T}\right)^5 \exp\left(-\frac{v_f^2}{2v_T^2}\right),$$

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ACCESSION NR: AP4044713

"The author is grateful to R. Z. Sagdeyev for his advice." Orig. art. has: 36 equations and 1 figure.

ASSOCIATION: none

SUBMITTED: 30Dec63 ENCL: 00

SUB CODE: ME NO REF SOV: 001 OTHER: 002

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L 43713-65 EWT(l)/EWP(m)/EPA(sp)-2/EWI(v)/EWA(d)/EPR/EPA(w)-2/T-2/FCS(k)/EWA(m)-2/EWA(h)/EWA(c) Pd-1/Pab-10/Pe-5/Ps-4/Pi-4 LJP(c) rm/GS

ACCESSION NR: AT5009749 UR/0000/64/004/000/0015/0022

AUTHOR: Karpman, V. I.

TITLE: The stability and evolution of magnetohydrodynamic shock waves

SOURCE: Soveshchaniye po teoreticheskoy i prikladnoy magnitnoy gidrodinamike, 3d, Riga, 1962. Voprosy magnitnoy gidrodinamiki (Problems in magnetic hydrodynamics); doklady soveshchaniya, v. 4, Riga, Izd-vo AN LatSSR, 1964, 15-22

TOPIC TAGS: shock wave, shock wave stability, shock wave evolution, magnetohydrodynamic shock wave, Joule heating, electron ion collision

ABSTRACT: Shock waves in a rarified plasma within a very strong magnetic field (coinciding with the wave front plane) are discussed. Here one can neglect all dissipative effects with the exception of Joule heating caused by electron-ion collisions. In the case of low effective electron-ion collision frequencies the shock wave front has an oscillatory structure as shown by R. Z. Sagdeyev (ZhTF, 1961, 31, 10, 1185). The author discusses: 1) the high collision frequency case when one can apply the evolutionary conditions of ordinary magnetohydrodynamics (see, e.g., R. V. Polovin, UFN, 1960, 72, 1, 3); and 2) the case when, within a

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ACCESSION NR: AT5009749

sufficiently rarified plasma, there exist weakly damped perturbations with frequencies comparable to the ionic Larmor frequency ω_H. In this last case, the analysis must take into account dispersion effects near ω_H. "The author thanks R. Z. Sagdeyev for suggesting the problem and for fruitful discussions." Orig. art. has: 38 formulas and 1 figure.

ASSOCIATION: None

SUBMITTED: 11Aug64 ENCL: 00 SUB CODE: ME

NO REF SOV: 007 OTHER: 000

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